in amount were: 5th to 8th, 18th to 20th, and the last five or six days of the month. It was heavy over much of the district on the 6th, 7th, 8th, and 26th. The totals for the month ranged from 4 to 6 inches over the upper watershed of the Youghiogheny and Cheat Rivers, the southern portion of West Virginia, and over the upper watersheds of the Cumberland and Tennessee Rivers, and between 1 and 3 inches over the rest of the district. The smallest amount at any station in the district was 0.24 inch at Loretto, Ky., and the largest 7.86 inches at Pickens, W. Va.

SNOWFALL.

Some snow fell during the month in all parts of the district, except in southwestern Tennessee and northern Alabama. The total amounts for the month varied from a trace to 28 inches. There were from 3 to 28 inches over western Pennsylvania, the latter amount being reported from Somerset on the Youghiogheny watershed; from 20 to 23 inches in Garrett County, Md.; from 4 to 9 inches in the higher elevations of West Virginia; and 3 to 17 inches over the watersheds of the Mahoning, Muskingum, and upper portions of the Scioto Rivers in Ohio. Snowfall over the rest of the district was not of much importance, only an occasional station reporting as much as 2 or 3 inches. Snow fell quite generally over the district on the 1st, 30th, and 31st. It was general over northern sections almost daily from the 2d to 7th, inclusive, and again on the 14th, 15th, and 16th. Snow did not remain on the ground long after any fall. The greatest amount on the ground at any one time was from 6 to 10 inches over the Allegheny and Kiskeminitas watersheds from about the 6th to 10th. Sleet occurred in considerable quantity over various sections on the 6th; it also was more or less general in the more northerly sections on the 7th and 8th; in some portions of Kentucky on the 18th; and considerable in amount over Ohio on the 27th. On the 7th 4 inches of sleet fell at Wytheville, Va., in a little over 12 hours.

MISCELLANEOUS.

Thunderstorms occurred quite generally on the 5th, 6th, and 7th over Tennessee, Kentucky, Indiana, and Illinois and locally in Virginia and North Carolina and a few other portions of the district. They were again general on the 9th and 10th, except in Indiana and Illinois, and on the 12th and 26th; and were more or less general on the 27th, 28th, and 29th, while there were scattered local thunderstorms on the 13th. Hail attended the thunderstorms in localities on the 7th, 9th, 10th, 12th, 13th, 27th, 28th, and 29th. The hail in some instances was rather severe and did considerable damage. Strong winds prevailed on a number of days, and they were notably high on the 15th, 17th, and 27th. On the 27th a severe windstorm passed across the State of Ohio doing considerable damage to wires, trees, roofs, and frail buildings. A number of timber fires were reported in Illinois.

Rivers.—In Pennsylvania rivers remained at good stages during the entire month, while they were low for the season in West Virginia. At Parkersburg, W. Va., the highest stage of the Ohio River during the month, 12.8 feet on the 31st, is the lowest maximum stage on record for March. The Cumberland and Tennessee Rivers and most of the other tributaries of the Ohio were at moderate stages during the month. There was a big tide, however, in the upper reaches of the Cumberland River in Kentucky, due to heavy rains of the 6th–8th in the mountain section. The tide, estimated at 45 feet, enabled the lumber mills in that region to secure a large supply of saw logs. The stages in the upper reaches of the Wabash and tributaries were comparatively low throughout the month and fluctuated but little. Moderate stages were attained in the lower stretches of the White and Wabash Rivers near the middle of the month, but there was a general decline after that time and low water obtained at the close of the month.

A PALL OF DARKNESS, AT LOUISVILLE, KY., AND SURROUNDING DISTRICTS, BY FERDINAND J. WALZ, SECTION DIRECTOR.

On the morning of March 7, shortly after 8 o'clock, a low-hanging storm cloud rolled over Louisville, Ky., wrapping the city and surrounding country in darkness so intense that objects a few feet away could not be distinguished and birds and chickens went back to roost. It began growing dark about 7.55 a. m., but about 8.05 a. m. an unusually black and low-hanging cloud was observed coming rapidly out of the west. This cloud in a few minutes completely enveloped the city, and darkness increased until at 8.15 a. m., when it was densest, it was as black as night. About 8.20 a. m. it began to clear in the northwest and in a few minutes the dark cloud had disappeared in the east.

Rain had been falling in varying amounts, never more than moderately heavy, since midnight, but during the passage of the dark cloud it increased to a considerable downpour and was attended by hail, a few flashes of lightning, but very little thunder, and a wind squall. The latter lasted only about three minutes, 8.15 to 8.18 a. m., and reached a maximum velocity of about 60 miles per hour.

The barometer had been falling steadily since 1 a. m., the decline being about 0.36 inch from 1 a. m. to 8. a. m., but when the black cloud struck there was a sudden rise of nearly 0.25 inch and an almost equally sudden fall with its passing away. The station barometer at 7 a. m. read 29.41 inches, at 8.16 a. m. 29.64 inches, and at 8.30 a. m. 29.42 inches, marking a change in pressure of nearly 0.50 inch in one-half hour. There was a fall in temperature of about 4 degrees. The winds were from the east up to 8.10 a. m., when they backed quickly to the northwest with the squall, but at 8.25 a. m. they veered to northeast and continued from that direction during the rest of the day.

The intense blackness and generally ominous appearance of the storm spread terror throughout the city, augmented no doubt by the fact of this community having been visited by a devastating tornado in March, 1890, when 76 people lost their lives. Also, happening at the time of day it did, hundreds of school children were on their way to school and parents were wild with apprehension for the safety of their children. On the streets men and women ran wildly to escape the impending storm, horses were frightened, and, when the hail began to pelt them, many ran away, residents generally were terrorized, and for a short half hour confusion reigned.

An investigation of the general weather conditions obtaining March 7 shows that at 7 a. m., central standard time, a barometric disturbance of moderate gradient covered the central Mississippi Valley. The area of disturbance was elliptical in shape, the major axis extending about 650 miles in nearly an east and west direction and the minor axis about 450 miles in nearly a north and south direction. The circumference of the ellipse was formed by the closed isobar of 30.1 inches. There were two distinct centers of low pressure, one about Springfield,

Mo., barometer 29.98 inches, the other at Evansville, Ind., barometer 29.95 inches, these two places very nearly coinciding in position with the foci of the ellipse.

During the day the disturbance as a whole moved southeastward and at 7 p. m., central standard time, was centered about northwestern Georgia. (See figs. 1 and 2, daily weather maps 7 a. m. and 7 p. m., central standard time.)

The temperature gradient at 7 a. m., as shown by the following readings, was considerable: Memphis, 66°; Nashville, 62°; Cairo, 52°; St. Louis, 42°; Evansville, 44°; Louisville, 42°; Lexington, 40°; Indianapolis, 34°; Cincinnati, 36°; and Parkersburg, 34°.

to the Ohio River. Reaching that river at a point near its mouth, it advanced up the river to Louisville, Ky., where turning nearly due eastward it passed on over the bluegrass region of Kentucky, finally disappearing among the Appalachian foothills in eastern Kentucky. During the time this storm was advancing through Kentucky a violent sleet storm was raging over southwestern Virginia, 4 inches of sleet falling at Wytheville, Va., between 7.40 a. m. and 9.27 p. m.

There was very little disturbance noted at Nashville, Tenn., on the south, and Indianapolis and Cincinnati on the north, and at Parkersburg, W. Va., on the east. Particularly noticeable are the sharp peaks in the barometric

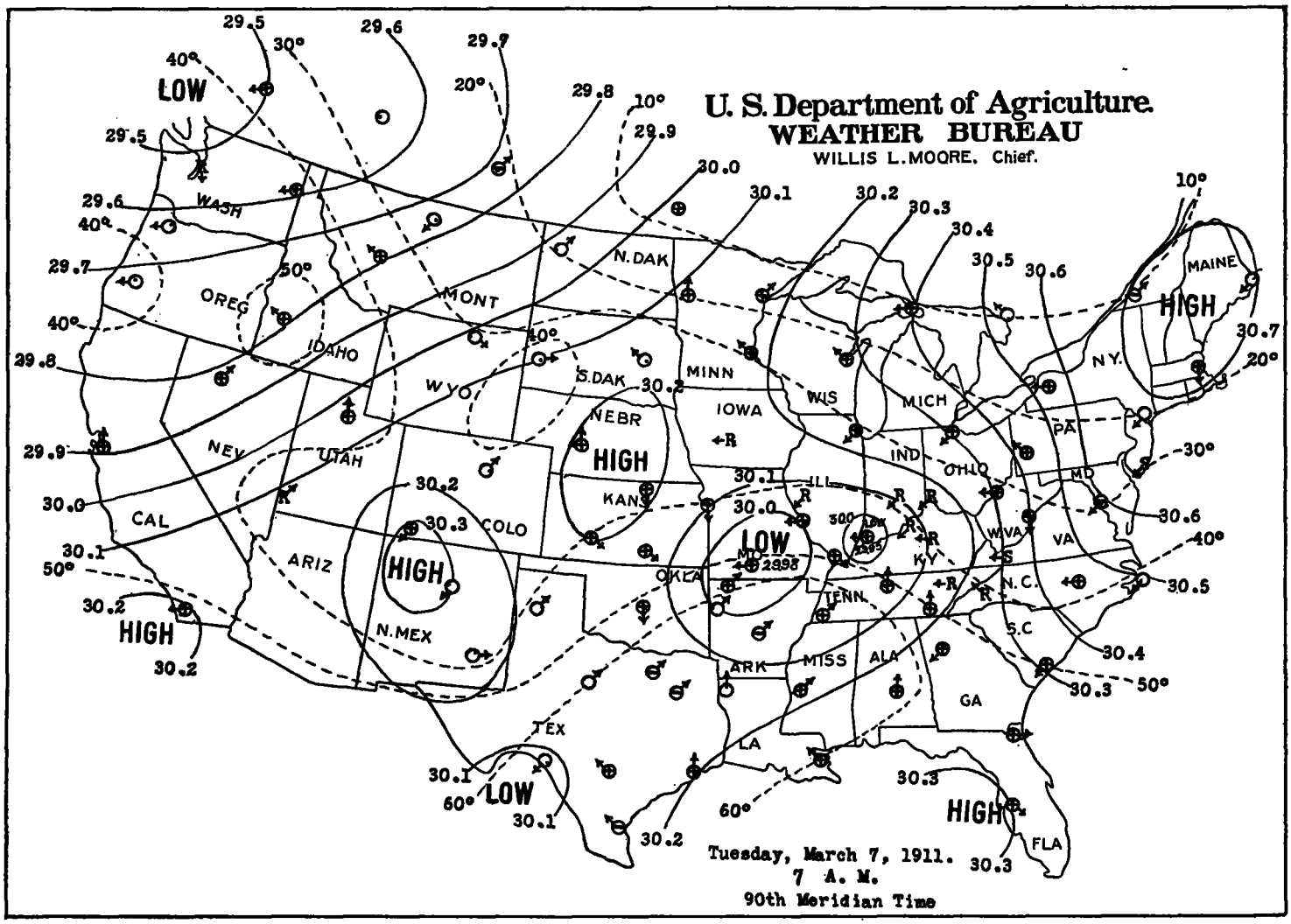

FIG. 1.—Daily weather map.

The course of the smaller center of action, or the one located near Evansville, Ind., at 7 a. m., can be fairly well followed from the barograph trace sheets at the several regular stations of the Weather Bureau. (See fig. 3.)

These curves show sharp barometric disturbances occurring at St. Louis about 4.50 a. m.; at Cairo, Ill., about 6.52 a. m.; at Evansville, Ind., about 7.02 a. m.; at Louisville, Ky., about 8.15 a. m., and at Lexington, Ky., about 8.55 a. m. The time of appearance of the hailstorm, wind squall, and remarkable darkness at each of these stations coincides with the time of the barometric disturbance as shown on the tracings. The course of the storm appears to have been about as follows: Commencing at St. Louis, it continued in a southeastward direction

tracings at stations visited by the storm, and the depressions in the tracings at stations lying north of its path, especially at Indianapolis. Also the marked rise in temperature occurring during the day at Nashville, Tenn., and Cairo, Ill., contrasts strongly with the very small change in temperature occurring at other stations in the Ohio Valley. (See fig. 4.)

The following extracts are taken from the reports of officials in charge of the several Weather Bureau stations:

St. Louis.—The storm of March 7 ended in the early morning and no unusual phenomena could be observed directly. The extreme velocity of the wind was 45 miles per hour, and hail, estimated at 0.05 inch, occurred shortly before 5 o'clock. The storm was severe in parts of the city.

Cairo, Ill.—Relative to the storm of March 7, the wind was south until 6.52 a. m., when it shifted suddenly to northwest, and a heavy, dark cloud was observed approaching from that direction. We observed that it became quite dark at 7 a. m., when it seemed as if a rainstorm might be in progress on the Kentucky side of the Ohio River northeast of the station. The wind reached a velocity of 26 miles per hour from the northwest at 7.10 a. m., but by 7.15 a. m. it had decreased to 12 miles per hour.

Evansville, Ind.—On March 7 the day opened cloudy, with a cloudy sunrise and a light fog prevailing over the city and its vicinity. At about 7.02 a. m. the wind suddenly backed from southeast, through east and northeast, to northwest, with a sudden increase in velocity from fresh to high; light rain began; the barometer began to rise rapidly; the light fog became dense, and a mass of dark, threatening clouds, having the appearance of an approaching thunderstorm, began moving in from the southwest. The dense fog combining with the dark clouds resulted in a pall of darkness, almost as dark as night, settling over the city and vicinity. A high gust of northwest wind, reaching 26 miles per hour, did some minor damage to chimneys, cornices, copings, overhead wires, shade trees, shrubbery, etc., throughout the city. The high wind lasted only about 5 minutes, from 7.03 to 7.08 a. m. The spell of darkness lasted for about 6 minutes.

Lexington, Ky.—A thunderstorm began during the night and ended at 10 a. m. The rain was heavy the last two hours of the storm, but there was very little wind. Lightning was very sharp during the few minutes in which hail fell. The hailstones were about the size of peas, and were not enough to do any damage. About 9 a. m. it became so dark that it was necessary to turn on the lights. The period of darkness lasted about 20 minutes.

Cincinnati, Ohio.—On the morning of March 7 there was no unusual darkness beyond what might ordinarily attend cloudy weather at this station. There was no thunderstorm on that day and no hail. The wind direction varied from north to east between 8 and 10 a. m., being generally from the northeast. There was no decided variation in wind velocity during that time.

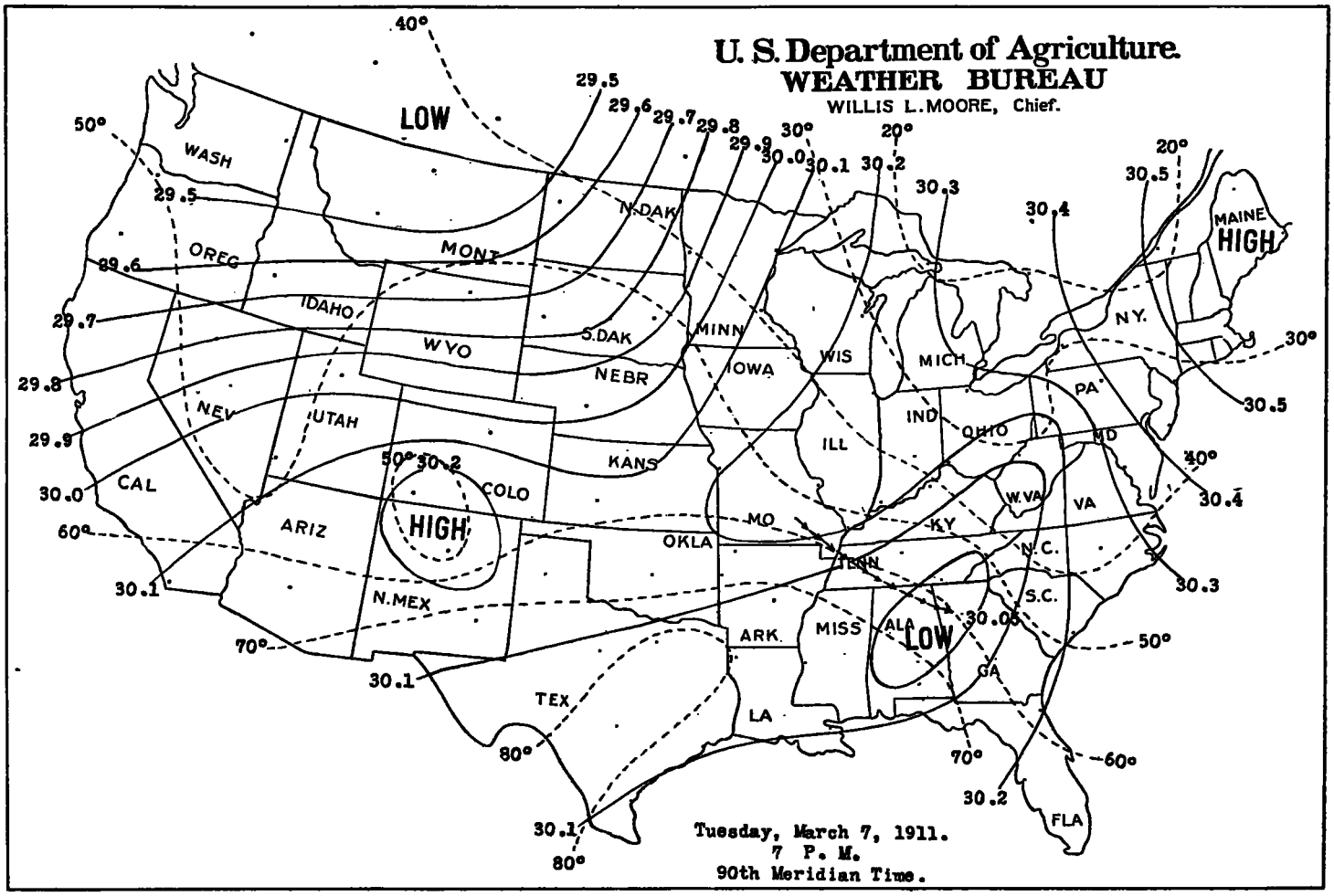

FIG. 2.—Daily weather map.

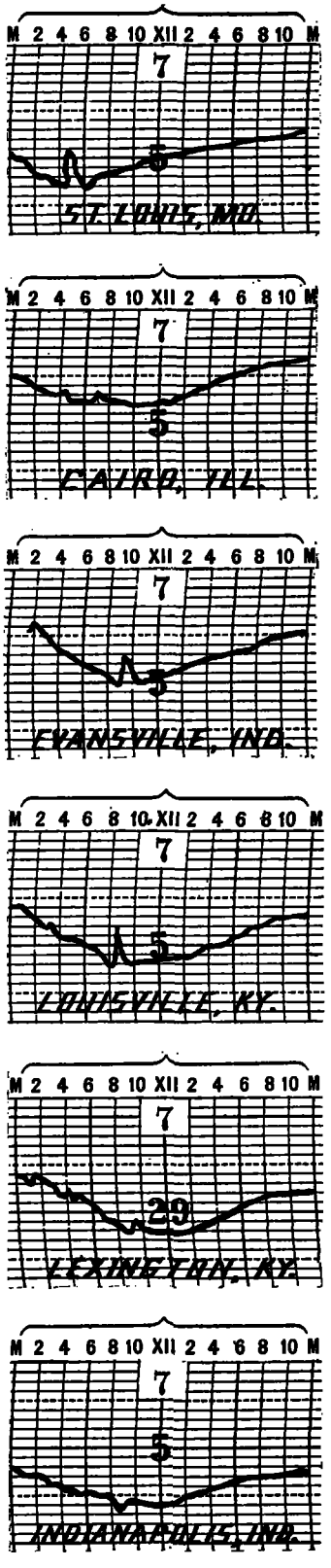

FIG. 3.—Barograms.

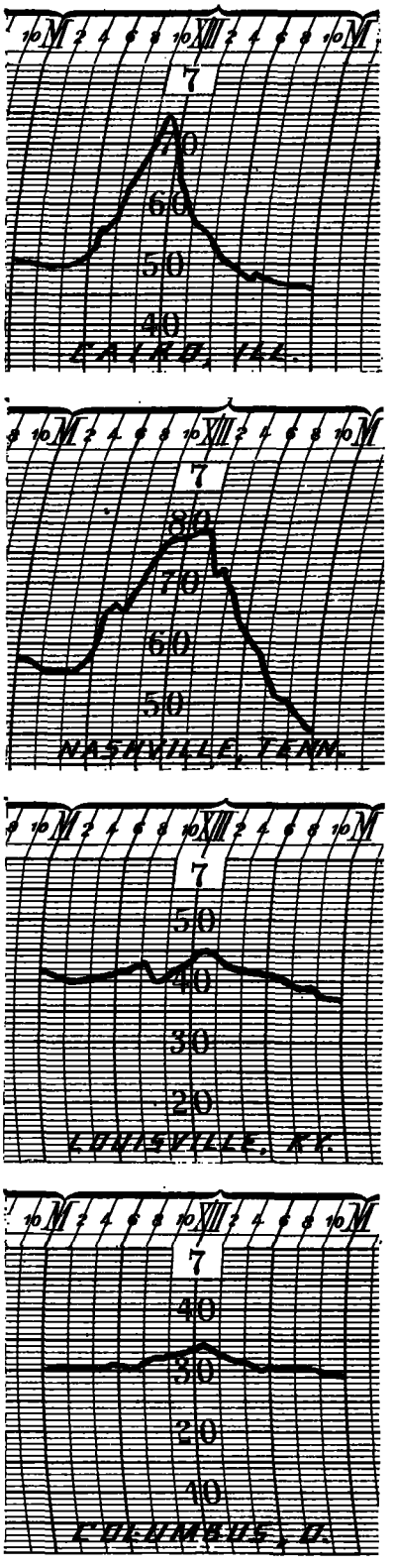

FIG. 4.—Thermograms.